

where the economic advantages of statistical control are coming to be more and more recognized. Huge financial savings are being effected, not only in industry, but also in a number of government departments by the application of statistical methods.

My main theme is that the interpretation of scientific data involves prediction. Facts, so far as science is concerned, have meaning only in the predictions that can be made from them. A prediction must be made in terms of some operation that will prove the prediction either true or false. The methods of the statistician take into account the variabilities in nature, and his special training enables him to make the most efficient use of data for valid predictions when it is possible to make predictions. He also knows when predictions can not be made. The statistical method is an aid to the scientist in understanding the nature of the knowledge that he is continually seeking.

In conclusion, it is a pleasure to express my indebtedness to conversations with Dr. Frank Wenner of the National Bureau of Standards, particularly in regard to the interpretation of certificates.

BOTANY.—*Names in Amaranthus, Artocarpus, and Inocarpus.*¹
F. R. FOSBERG, U. S. Bureau of Plant Industry. (Communicated
by W. T. SWINGLE.)

To make available the correct names for certain species and to save other workers the trouble of searching the literature for a solution to the *Amaranthus tricolor* problem, it seems worth while to publish the notes given below.

***Amaranthus tricolor* L. [Amaranthaceae]**

In *Species plantarum*, ed. 1, p. 989, 1753, Linnaeus described *Amaranthus tricolor*, *A. melancholicus*, and *A. tristis*, distinguished by trifling differences in leaf color and outline. In edition 10 of the *Systema*, p. 1268, 1759, he added *A. gangeticus*, also very closely allied to the above three. Various other species were added to the complex later, but as they have no bearing on the nomenclatorial problem, they will not be discussed here. The object of this note is to establish which of the above names is correct if all four names are considered synonymous, the opinion held by most modern botanists.

Botanists generally, with the exception of Lamarek and Moquin, up to the time of Hooker's *Flora of British India* (1885), followed Linnaeus without question in recognizing at least four species. Lamarek, in the first volume of the *Encyclopédie méthodique* (p. 115, 1783) made *A. melancholicus* L. a variety of *A. tricolor* L., but recognized *A. gangeticus*, *A. mangostanus*, and *A. tristis* as distinct species. Poiret, in the *Supplement* (vol. 1, pp. 311–312.

¹ Received November 27, 1940.

1810) and in the text to the *Tableaux* (p. 355, text for pl. 767. 1823) restored *A. melancholicus* to specific rank.

Moquin, in DeCandolle's *Prodromus* 13 (2): 262. 1849, evidently misinterpreting Poiret's synonymy, made *A. tricolor* a variety of *A. melancholicus*, citing the *Tableaux* as authority.

Boissier, in the *Flora Orientalis* 4: 990. 1879, mentioned only *A. gangeticus*, giving neither synonyms nor related species.

J. D. Hooker, in the *Flora of British India* 4: 719-720. 1885, reduced *A. tricolor*, *A. melancholicus*, and *A. tristis* (the latter with some doubt) to the later *A. gangeticus*. The reason for this abrogation of the rule of priority is not clear to me. Perhaps it was simply an oversight due to the unfortunate custom, then in vogue, of omitting the dates from all reference citations. At any rate, *A. gangeticus* can not be the correct name for the aggregate. British botanists, during the next quarter century, except Hiern in the *Catalogue of Welwitsch's African plants* 2: 887. 1900, and Baker and Clarke in the *Flora of Tropical Africa* 6 (1): 32. 1909, followed Hooker's disposition of the matter. Some other botanists (cf. Kung Hsien-wu in Liou Tchen-ngo, *Fl. Ill. du nord de la Chine* 4: 15. 1935) even much more recently, are still following him, in obvious disregard of the rules of nomenclature.

Fiori and Paoletti, in *Flora analitica d'Italia* 1: 321. 1898, were the first modern botanists to reduce *A. gangeticus*, *A. mangostanus*, and *A. melancholicus* to *A. tricolor*. *A. gangeticus* was maintained in a subordinate category. No mention was made of *A. tristis*.

In this century Hiern (see above), Baker and Clarke (see above), Thellung (in Ascherson and Graebner, *Syn. Fl. Mittel-Eur.* 5: 272-280. 1914), Merrill (*Enum. Phil. Fl. Pl.* 2: 128. 1923 and other papers), and Bailey (*Man. Cult. Pl.* 252. 1924) have followed this course, which seems to be the correct one.

Article 56 of the International Rules (Cambridge) reads, in part: "When two or more groups of the same rank are united . . . if the names or epithets are of the same date . . . the author who first adopts one of them, definitely treating another as a synonym or referring it to a subordinate group, must be followed." Strict application of this rule makes it quite clear that the reduction by Lamarck (*Encycl.* 1: 115. 1783) of *A. melancholicus* to a variety of *A. tricolor* determines that the latter is the correct name for the aggregate (unless someone should show that two or more of the species had been combined previous to Lamarck's publication).

The essential synonymy to establish this point is given below. The extensive post-Linnaean synonymy is largely unnecessary here and may be found in the intricate treatment of *A. tricolor* L. by Thellung in Ascherson and Graebner, *Syn. Fl. Mittel-Eur.* 5: 272-280. 1914.

***Amaranthus tricolor* L. Sp. Pl. 989. 1753.**

Amaranthus melancholicus L. Sp. Pl. 989. 1753.

Amaranthus tristis L. Sp. Pl. 989. 1753.

Amaranthus gangeticus L. Syst. X: 1268. 1759.

Amaranthus mangostanus L. Cent. I: 32. 1755.

Amaranthus tricolor L. var. *melancholicus* Lam. Encycl. 1: 115. 1783.

Amaranthus melancholicus L. var. *tricolor* Lam. ex. Moq. in DC. Prodr. 13 (2): 262. 1849.

Artocarpus altilis (Parkinson) Fosberg [Moraceae]

In a longer paper, not as yet published, I have discussed the validity of the names published in Parkinson's *Journal of a voyage to the South Seas in H.M.S. Endeavour*, etc., published in 1773. As it may be some time before this paper is published, it seems desirable to make the necessary combinations for this and the following well-known species, so that they may be used.

The well-described genus *Sitodium* Parkinson antedates by three years *Artocarpus* Forst. I have elsewhere (Amer. Jour. Bot. 26: 231. 1939) proposed *Artocarpus* for conservation, as it contains well-known economic plants (breadfruit, jakfruit), but, owing to the European war, there seems little chance of holding a congress in the near future to vote on such propositions. In the meantime it seems desirable to go on using the name *Artocarpus*, rather than making a temporary shift to the unfamiliar *Sitodium*. Since the principle of conserved specific names was decisively rejected by the congress in 1935, it is necessary to transfer Parkinson's specific epithet to *Artocarpus*.

E. J. H. Corner, in a well-thought-out article in Gard. Bull. S. S. 10: 280-282. 1939, discussed the reasons why *Artocarpus incisus* (Thunb.) L. f. should be used for the common breadfruit rather than *A. communis* Forst., both specific epithets published the same year (1776), with no indication available as to which was earlier. The problem would have been solved without the discussion had Corner been aware of the availability of Parkinson's epithet, published three years earlier. The combination and synonymy follow:

Artocarpus altilis (Parkinson) Fosberg, n. comb.

Sitodium altile Parkinson, Journ. Voy. *Endeavour* 45. 1773.

Artocarpus communis Forst. Char. Gen. 101. 1776.

Radermachia incisa Thunb. Handl. Vet.-Akad. Stockh. 37: 254. 1776.

Artocarpus incisus (Thunb.) L. f. Suppl. 411. 1781.

Corner's spelling of Thunberg's generic name *Rademachia* instead of *Radermachia* is an error that, according to the *Index Kewensis*, originated with Steudel.

Inocarpus fagiferus (Parkinson) Fosberg [Leguminosae]

Aniotum Parkinson, as in the case of *Sitodium* mentioned above, antedates a well-known generic name, *Inocarpus*, the Tahitian chestnut, *mape* (Tahiti), *kopit* or *kerepit* (Malay, cf. Corner, Gard. Bull. S. S. 10: 269. 1939). As with *Artocarpus*, I have proposed *Inocarpus* for conservation, and for the same reasons as given above, I am here making the combination for Parkinson's specific name under *Inocarpus*.

Inocarpus fagiferus (Parkinson) Fosberg, n. comb.

Aniotum fagiferum Parkinson, Journ. Voy. *Endeavour* 39. 1773.

Inocarpus edulis Forst. Char. Gen. 66. 1776.

Corner (Gard. Bull. S. S. 10: 269–270. 1939) in his discussion of whether this species is native in Malaya cast some doubt on the statement of Brown (Bishop Mus. Bull. 130: 118. 1935) that in the Marquesas this species reaches a height of 10 meters. He describes it as “a smallish and slow-growing tree.” I know nothing about the rate of growth and have not actually measured any trees. No one, however, who has seen the trees of this species in some of the deep valleys of Tahiti (Aparé Maué, Papenoo, etc.) could possibly describe the tree as smallish. It has huge buttressed trunks, many feet in diameter, that compare favorably with the giant ceiba trees shown in tropical pictures, and the trees are certainly well in excess of 10 meters tall.

BOTANY.—*New Acanthaceae from Guatemala*.¹ E. C. LEONARD, U. S. National Museum. (Communicated by WILLIAM R. MAXON.)

During the 1938–39 Sewell Avery Expedition of the Field Museum of Natural History to Guatemala, Paul C. Standley collected a considerable number of Acanthaceae. In the present paper, based on a study of these specimens, six new species are described, one is transferred from *Eranthemum* to *Pseuderanthemum*, and one is renamed.

Ruellia brittoniana Leonard, nom. nov. Fig. 1

Cryphiacanthus angustifolius Nees in DC. Prodr. 11: 199. 1847. Not *R. angustifolia* Sw., 1788.

Ruellia spectabilis Britton, Ann. New York Acad. 7: 192. 1893; not Nichols, 1886.



Fig. 1.—*Ruellia brittoniana* Leonard: *a*, Portion of plant, half natural size; *b*, capsule, natural size.

Cultivated near Quiriguá, Department Izabal, Guatemala, altitude 70 to 150 meters, April 26–27, 1939, *Standley 72225*.

¹ Received November 8, 1940.